# Session 3: Advanced AI Applications Workbook

**Afternoon Session (13:30 – 16:30)**

## Exercise 3: Portfolio Stress Testing (60 Minutes)

Role: Portfolio Risk Manager

Scenario: You manage a $5 Billion Global Multi-Asset Fund (60% Equities / 40% Bonds). The Investment Committee is worried about a specific geopolitical shock (e.g., "Stagflation" or "Oil Crisis").

### Part A: Define the Shock (Perplexity)

1. **Objective:** Quantify a narrative risk.
2. **Prompt:** *"Act as a Macro Strategist. I need to stress test a portfolio against a [Choose Scenario: e.g., '1970s Style Stagflation' or '2008 Credit Crunch']. Provide the approximate peak-to-trough drawdowns for 1) Global Equities and 2) Investment Grade Bonds during that historical period."*
3. **Output:** Note the percentages (e.g., Equities -30%, Bonds -10%).

### Part B: Run the Simulation (ChatGPT)

1. **Objective:** Visualize the impact on your specific portfolio.
2. **Prompt:** *"I have a portfolio that is 60% SPY (S&P 500) and 40% AGG (US Bonds). Write a Python script using the yfinance library to:*
   * *Download daily data for these tickers for the last 5 years.*
   * *Calculate the daily correlation between them.*
   * *Simulate a stress event where SPY drops by [X]% and AGG drops by [Y]% (use the numbers from Part A).*
   * *Calculate the total portfolio loss in dollars on a $5 Billion AUM."*
3. **Action:** Copy the code, run it (if you have a local environment) or ask ChatGPT to "Run this analysis" using its internal data (if it cannot access yfinance, ask it to use dummy data for the simulation).

### Part C: The Hedge (Claude)

1. **Objective:** Find a qualitative solution.
2. **Prompt:** *"Based on a scenario where both Equities and Bonds fall simultaneously (correlation = 1), suggest 3 alternative asset classes that historically have maintained negative correlation to a 60/40 portfolio. Explain the mechanism of protection for each."*

## Exercise 4: The "Due Diligence Sprint" (60 Minutes)

Role: Private Equity Associate

Scenario: You are evaluating "Nebula SaaS", a B2B software company. You have received a Virtual Data Room (VDR) dump. You have 30 minutes to find the red flags.

### Part A: Legal Landmines (Claude)

*Requires File: 'Nebula\_Service\_Agreement.pdf' (Sample Contract)*

1. **Upload:** The sample customer contract.
2. **Prompt:** *"Act as a General Counsel. Review this standard customer agreement. specifically look for:*
   * *Termination for Convenience: Can the customer leave without penalty?*
   * *Cap on Liability: Is our liability limited to fees paid, or is it uncapped?*
   * *Most Favored Nation (MFN): Do we promise this customer the lowest price?"*
3. **Deliverable:** A "Red Flag" summary (e.g., "Risk: Customer can cancel with 30 days notice").

### Part B: Financial Forensics (ChatGPT)

*Requires File: 'Nebula\_Monthly\_Revenue.csv' (Sample Data)*

1. **Upload:** The revenue CSV file.
2. **Prompt:** *"Analyze this revenue data for seasonality and anomalies. Specifically, look at the revenue recognized in the last month of each quarter (March, June, Sept, Dec). Is there a statistically significant spike compared to the first month of the quarter? Visualize this trend."*
3. **Concept:** You are looking for **"Channel Stuffing"**—pushing sales into the end of the quarter to hit targets, which often leads to churn later.

### Part C: The Memo (Claude)

1. **Prompt:** *"Draft the 'Key Risks' section of an Investment Memo for Nebula SaaS. Incorporate the legal risk (Termination for Convenience) and the financial risk (potential Channel Stuffing) we identified. Use a professional, bearish tone."*

## Exercise 5: Building a Monitor (45 Minutes)

Role: Asset Manager

Scenario: You bought the company. Now you need to make sure they aren't committing fraud.

### Part A: Benford's Law Analysis (ChatGPT)

*Requires File: 'Vendor\_Payments\_Q3.csv'*

1. **Context:** Benford's Law states that in natural financial datasets, the first digit '1' appears ~30% of the time. Fraudulent (human-invented) numbers often appear uniformly (~11% each).
2. **Upload:** The vendor payments file.
3. **Prompt:** *"Perform a Benford's Law analysis on the 'Amount' column of this vendor payment ledger. Plot the actual distribution of first digits vs. the theoretical Benford distribution. Flag any digits that deviate significantly."*

### Part B: Sentiment Monitoring (Perplexity)

1. **Objective:** Set up an early warning system.
2. **Prompt:** *"I need to monitor the 'Lithium Ion Battery' supply chain risks. List 5 specific leading indicators I should check weekly (e.g., specific commodity indices, shipping routes, or regulatory databases). For each, provide a direct URL if available."*

## End of Day Deliverable

**Submit a single PDF containing:**

1. The **Dollar Loss** calculated in the Portfolio Stress Test.
2. The **Legal Red Flag** found in the Nebula Contract.
3. The **Benford's Law Graph** showing potential fraud.